

## ABSTRACT OF THE DISCLOSURE

[66] A low-density parity check device can process data using a special low-density parity check matrix having a size of  $n$ -rows by  $m$ -columns. By styling the matrix such that the matrix is composed of  $p$  equal-size square sub-matrices, only the first row of the first sub-matrix need be generated and stored. By then further constraining each of the sub-matrices to form various sub-portions, with each sub-portion constructed such that any two columns within the sub-portion will have no common location containing a non-zero entry, processing advantages are gained.